Chapter 2
Background

During the last few years, California has provided substantial funds to local agencies to enhance local groundwater management programs. One example is Proposition 13 (Water Bond 2000), which allocated $2 billion for groundwater feasibility studies and construction of groundwater recharge facilities. Additionally, the Local Groundwater Management Assistance Act of 2000 (AB 303) resulted in $15 million for groundwater studies and data collection in an effort to improve the quality of groundwater basins. AB 303 authorized grants to help local agencies develop better groundwater management strategies. AB 599 (2001) required the State Water Resources Control Board (State Water Board), in cooperation with other agencies, to develop a comprehensive monitoring program capable of assessing groundwater quality. These bills are significant with respect to groundwater because much of California's new development will rely on groundwater to satisfy its water needs.

Finally, the most relevant legislation passed in 2002 was Senate Bill (SB) 1938. SB 1938 was enacted to provide financial incentives to local agencies for improved groundwater management. The legislation modified the Water Code to require specific elements be included in a GMP for an agency to be eligible for such incentives, including possible award of AB 303 and Proposition 50 grant funds.

Zone 7 has a long history of groundwater basin management and a long history of cooperation with local and state agencies in the implementation of its basin management practices. This report is intended to compile the elements of the existing groundwater management programs and policies in a standardized format similar to other basin plans prepared in California. This Groundwater Management Plan (GMP) simply expands the goal stated in 1987 of "informing the public and relevant governmental agencies of the Zone's supply potential and management policies, and to solicit their input and cooperation" (1987 Statement On Groundwater Management).

2.1 History of Previous Area Investigations

In the early 1900's groundwater provided the majority of agricultural and domestic water demands of the Livermore Valley. Then, the Spring Valley Water Company collected hydrologic data on rainfall, streamflow, and groundwater levels. Spring Valley Water Company also pumped from wells in

Pleasanton and exported the water to provide a water supply for San Francisco. In 1930, San Francisco purchased Spring Valley Water Company. Early reports provide excellent descriptions of the sources and flow of groundwater. Early monitoring and development of the groundwater resources by Spring Valley helped early investigators understand the general structure of the groundwater basin. A key finding of these early studies was that the groundwater supply was not limitless but was actually less than about 20,000 acre-feet per year (af/yr). These early studies also concluded that the majority of supply was derived from stream recharge through the very gravelly streambeds that cross the valley floor. Based on the results of this study, San Francisco decided to look to the Tuolumne River and constructed the Hetch Hetchy system to provide a much larger supply for San Francisco. San Francisco purchased Spring Valley Water Company in 1930 and continues to pump small amounts of water from wells in Pleasanton to provide water for the Castlewood area west of Pleasanton.

In the mid-1940s, significant overdraft in the Livermore Valley resulted in a call from local farmers to the state. DWR's predecessor (Department of Public Works, Division of Water Resources) undertook studies of this area in addition to other similar basin conditions statewide. Report No. 3 was published in 1952 entitled, *Groundwater Basins in California*. Report No. 3 identified 223 alluvium-filled valleys that were believed to be basins with usable groundwater in storage. This report was a major stepping-stone for groundwater investigations in California.[1]

In the 1950s groundwater and small stream diversions were the only source of water supply to the Livermore Valley. The area experienced severe floods in the winter of 1951 and 1955 with excessive water, only to be followed by dry summers with falling groundwater levels. To address these issues of water supply and flood control, the voters of the Livermore Valley formed Zone 7 with powers to manage surface and groundwater resources.

Several cooperative DWR and Zone 7 studies in the 1960s and 1970s established the scientific foundations for the Zone 7 Groundwater Management Plan. In 1963 DWR published Bulletin No. 13, which compiled the results of the Alameda County investigations. In 1966 DWR published the geology appendix to 118-2, and in 1974 DWR published Bulletin No. 118-2, "An Evaluation of Ground Water Resources: Livermore and Sunol Valleys" in cooperation with Zone 7. In the following years, Zone 7 built upon the framework of Bulletin No. 118-2 and the DWR groundwater model. The current hydrologic inventory 1974–2004 is merely an extension of the lessons learned from this early work. The report concluded, "The results of operations-economics studies recommended will be of significant use to local government in making decisions on conservation, development and use of the county's water resources."

In 1975, DWR published its first version of Bulletin 118, *California's Ground Water*, a document that provided state-wide observations and findings. The original Bulletin 118 summarized available information from DWR, the U.S. Geological Survey (USGS), and other agencies dealing with individual

[1] California Department of Water Resources 2003.

groundwater basins. In contrast to basin-specific studies such as DWR Bulletin 118-2, the purpose of Bulletin 118 was to help decision-makers regarding the protection, use, and management of the state's groundwater resources. Subsequent joint investigations with USGS expanded on the monitoring programs. Zone 7 developed an interim groundwater basin management plan in the late 1970s.

Despite California's heavy reliance on groundwater, there was much basic information missing for many groundwater basins. In particular, data necessary to provide for both the protection and optimal beneficial use were not available for many areas. The California Legislature mandated in the Budget Act of 1999 that DWR update Bulletin 118. In response, DWR prepared Bulletin 118 Update 2003, which included important missing regulatory information, updates and data omitted from the original Bulletin 118.[2]

In the Livermore Valley, Zone 7 has built on the work of DWR and has continued to measure and compile important records and knowledge essential to good groundwater basin management. Prior to the 1960s, groundwater had been the only supply of water to meet urban and agricultural demands in the Livermore Valley. ACFCWC District Zone 7 (Zone 7 Water Agency) was created in 1957 by public vote. The intent of the formation was to resolve the water supply and flooding needs of the valley and in part to manage the groundwater basin and reverse the then-existing overdraft condition of the groundwater basin. In 1962 the first SWP water was imported into the watershed, and Zone 7 began providing wholesale treated water and water for groundwater basin recharge via stream recharge and off-site percolation ponds.

Currently, groundwater provides about one third of the urban and agricultural demands of the valley. Zone 7 Water Agency manages the groundwater basin and, through an active conjunctive use program, manages both the supply and demand of water from the basin and the long-term water quality of the basin. Several retail water supply agencies continue to pump water from the basin to supply about 12% of the urban demands, and Zone 7 provides the remaining wholesale supply to meet the full urban and agricultural demands of the valley. Zone 7's supply comes from local runoff captured by the Del Valle dam and imported surface water. The Zone 7 supplies are either used directly or artificially recharged into the groundwater basin for storage and subsequently pumped via Zone 7's production wells.

In the late 1980's Zone 7 developed a Statement on Groundwater Management that was approved by the Zone 7 Board on August 19 1987. See Appendix E.

In the 1990's Zone 7 started a decade-long investigation of basin water quality with the goal of halting the slow degradation of groundwater quality evidenced by rising hardness and TDS levels in the main basin. This resulted in the development of an SMP. The related implementation plan was adopted by the Zone 7 Board in August 1999, expanded in the full SMP in early 2004 and approved by the RWQCB in September 2004. The Groundwater Basin is

[2] California Department of Water Resources 2003.

managed as part of a basin-wide integrated water management process. The goals are implemented primarily through the Zone 7 Water Operations Plan through an adaptive management process that integrates groundwater basin management with the conjunctive use of surface water and other available water resources.

2.2 Zone 7 Water Supply and Management

Zone 7 provides water resources management services to about 190,000 residents of the Livermore Valley. Zone 7 serves a large population as a water wholesaler of potable water to its retail contractors for municipal and industrial (M&I) use. In addition, Zone 7 supplies untreated water for agriculture, golf courses, and other nonpotable uses. The four major retail water supply agencies to which Zone 7 supplies treated water are the City of Pleasanton, the DSRSD, the City of Livermore, and California Water Service Company. Zone 7's water supply comes from three sources: (1) imported surface water from the SWP, (2) local runoff into Lake Del Valle, and (3) surface water stored in the groundwater basin.[3] Several retailers also pump water from the groundwater basin and have been doing so for at least four decades. Zone 7 provides groundwater basin management services to ensure that the historical pumping can continue as a reliable supply for the retailers.

Currently, Zone 7 has a contract with DWR for water deliveries through the SWP facilities. The SWP facilities include imported water from Lake Oroville via the Sacramento River, Sacramento–San Joaquin River Delta (Delta), and the SBA. In 2004, Zone 7 had an annual maximum allocation of 80,619 af/yr. Zone 7 has also contracted with Byron-Bethany Irrigation District and DWR for an additional 2,000–5,000 af/yr through SWP facilities. In addition, Zone 7 has also purchased water storage rights (65 thousand acre-feet [taf]) in the Semitropic Water Storage District groundwater basin located in south-central California, near Bakersfield, which will allow up to 3,250 afa minimum pumpback. Zone 7 is also negotiating for future purchased water storage rights for drought year protection with Cawelo Water District (up to 10,000 afa minimum pumpback).

Zone 7 shares the water rights of local runoff from Lake Del Valle with Alameda County Water District. The average local runoff into Lake Del Valle is about 22,000 af/yr. The average take of Lake Del Valle runoff by Zone 7 is approximately 8,000 af/yr, and is expected to rise to 9,300 af/yr with projected increases in local demand.[4]

The Zone 7 local groundwater basin has a storage capacity of over 240,000 acre-feet, with an annual average natural recharge into the basin of about 13,000 acre-feet. One method of artificial recharge used by Zone 7 is to release water into various streambeds (with extremely high percolation rates) managed by Zone 7.

[3] Salt Management Plan 2004a.

[4] Salt Management Plan 2004a; water can be captured as storage only to the extent that storage is available. Additional water can be captured if there is a place to use the water ("direct use"). The increase is based on a projected increase in demands through "direct use" rather than any change in storage capacity.

The amount of release is carefully monitored and various flows along the streams are measured to quantify the condition of the streambeds and the amount of water being introduced into the groundwater basin. A future recharge project will add the Chain of Lakes system, which are old mining pits where surface water can be stored and recharged. For more information about natural and artificial recharge into the groundwater basin, refer to Section 3.3, Groundwater Recharge.

2.3 Overview of Zone 7's Basin Management

Zone 7 manages the groundwater basin as part of a basin wide–watershed wide integrated water management process. The short-term goals are conveyed to the participants primarily through the Zone 7 Water Operations Plan and through an adaptive management process that integrates groundwater basin management with the conjunctive use of surface water and other available water resources. However, there are six key documents that provide the framework for Zone 7's groundwater management policies and programs, in general, and specifically for the preparation of such operational planning documents. These four documents are included in Appendix E and are incorporated by reference:

1. *Statement on Zone 7 Groundwater Management*, August 19, 1987 (1987 GWMP);
2. Resolution No. 1037, Adoption of *Wastewater Management Plan for the Unsewered, Unincorporated Area of Alameda Creek Watershed Above Niles*, May 19, 1982;
3. Resolution No. 1165, *Prohibition on Use of Septic Tanks in New Commercial and Industrial Developments*, August 28, 1985;
4. Resolution No. 03-2494, *Water Quality Policy for Potable and Non-Potable Water*, April 16, 2003 (Water Quality Policy);
5. Resolution No. 04-2662, *Reliability Policy for Municipal & Industrial Water Supplies*, August 18, 2004 (Supply Reliability Policy); and
6. *Salt Management Plan*, May 2004—note that the SMP Executive Summary is included in the appendix for reference; this document is fairly lengthy and a complete copy of the SMP can be reviewed upon request at the Zone 7 office.

The various programs that make up the overall basin management program of Zone 7 are divided into four focus categories: water supply objectives, water quality objectives, operational goals and groundwater protection objectives.

Water Supply Objectives:

- To maintain the balance between the combination of natural and artificial recharge and withdrawal (1987 GWMP).

- To maintain water levels high enough to provide emergency reserves adequate for the worst credible drought (1987 GWMP).
- Meet 100% of Zone 7's treated water customers' water supply needs, including existing and projected demands for the next 20 years, as set forth in Zone 7's 2005 Urban Water Management Plan (Supply Reliability Policy).
- Provide sufficient treated water production capacity and infrastructure to meet at least 75% of the maximum daily contractual demands with any one major supply, production or transmission facility experience an extended unplanned outage (Supply Reliability Policy).

Water Quality Objectives:

- Zone 7 shall continue to meet all state and federal primary standards for potable water deliveries (Water Quality Policy).
- Zone 7 shall meet all state and federal secondary (aesthetic) standards and, within technical and fiscal constraints, proactively reduce hardness levels to "moderately hard (75 to 150 milligrams per liter [mg/l]).
- Protect, enhance and improve the quality of the groundwater, including mineral quality (1987 GWMP; Water Quality Policy).
- Offset current and future salt loading (2004 SMP).

Operational Goals:

- Pump groundwater for municipal use in a way that, to the extent feasible, provides comparable delivered potable water quality to all retailers in the Zone 7 service area (2004 SMP).
- Utilize the Water Operations Plan to achieve water supply goals (2004 SMP).
- Inform the public and relevant governmental agencies of the Zone's supply potential and management policies, and to solicit their input and cooperation (1987 GWMP)
- Minimize water and operational costs through an adaptive management plan (2004 SMP).

Groundwater Protection Objectives:

- Require adequate well seals between surface level and well completion zone through imposition of appropriate well permitting conditions.
- Require destruction of abandoned wells to eliminate potential to act as a conduit for contaminant migration.

- Prevent build-up of nitrates through implementation of Wastewater Management Plan for the Unsewered, Unincorporated Area of Alameda Creek Watershed Above Niles.
- Identify high risk contamination cases and coordinate with lead oversight agency to require timely assessments and cleanups.

Note that *1987 GWMP* refers to the Board-approved 1987 Statement on Zone 7 Groundwater Management and *2004 SMP* refers to the Board-approved and RWQCB-accepted SMP.